

**PUBLIC PAGE**

**QUARTERLY REPORT**

**Project WP#339: Structural Significance of Mechanical  
Damage**

*For Period Ending:* November 30, 2008

*Contract No:* DTPH56-08-T-000011

*Prepared For:* United States Department of Transportation  
Pipeline and Hazardous Materials Safety Administration  
Office of Pipeline Safety

*Prepared By:* Aaron Dinovitzer  
Principal Investigator  
BMT Fleet Technology Limited  
311 Legget Drive  
Kanata, Ontario, Canada K2K 1Z8  
[adinovitzer@fleetech.com](mailto:adinovitzer@fleetech.com)

Mures Zarea, Rémi Batisse  
Principal Investigators  
GDF Suez R&T Department  
361 Ave du President Wilson  
B.P. 33, 93211 Saint-Denis, France  
[mures.zarea@gdfsuez.com](mailto:mures.zarea@gdfsuez.com)  
[remi.batisse@gdfsuez.com](mailto:remi.batisse@gdfsuez.com)

Mr. Ian Wood  
Team Project Manager  
Electricore, Inc.  
27943 Smyth Drive, Suite 105  
Valencia, CA 91355  
[ian@electricore.org](mailto:ian@electricore.org)

Mark Piazza  
Team Technical Coordinator  
Pipeline Research Council, International  
1401 Wilson Blvd., Suite 1101  
Arlington, VA 22209  
[mpiazza@prci.org](mailto:mpiazza@prci.org)



**Public Page for Quarter Ending November 30, 2008**

**Project WP#339: Structural Significance of Mechanical Damage**

**Background**

The primary objective of the project is to establish a detailed experimental database to support the development and validation of improved burst and fatigue strength models for assessing the interaction of mechanical damage with secondary features (gouges, corrosion, and welds). The use of this data to develop and validate mechanistic models will produce reliable tools to assess a wide range of mechanical damage forms, thereby increasing safety, reducing unnecessary maintenance, and supporting the improvement of pipeline standards and codes of practice.

**Progress in the Quarter**

GDF SUEZ created two combined defects “Dent - Gouge” one on a recent pipe specified as API X52 and the second on a recent pipe specified as API X65, both steels being characterized by a high level of ductility:

- Defect 1.2.2 on pipe grade X52.
- Defect 2.1.2 one pipe grade X65.
- The maximum gouge depths and dent depths (measured without internal pressure) are respectively of 30% and 2% for defect 1.2.2 and 19% and 1,3% for defect 2.1.2. The gouges are respectively 115 mm and 195 mm long. These values correspond to the defect types 1.2.1 and 2.1.1.

Burst tests were performed on both defects. Defect 1.2.2 burst at 59% of the burst pressure of defect 2.1.2. But the significant difference is the failure mode, by leak for defect 1.2.2 and by rupture for defect 2.1.2. After tests all instrumentation records were represented in graphical form, and principal strains and principal directions were determined from the strain gauges records.